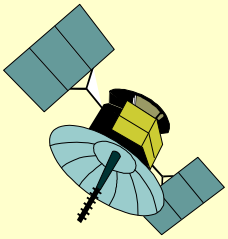
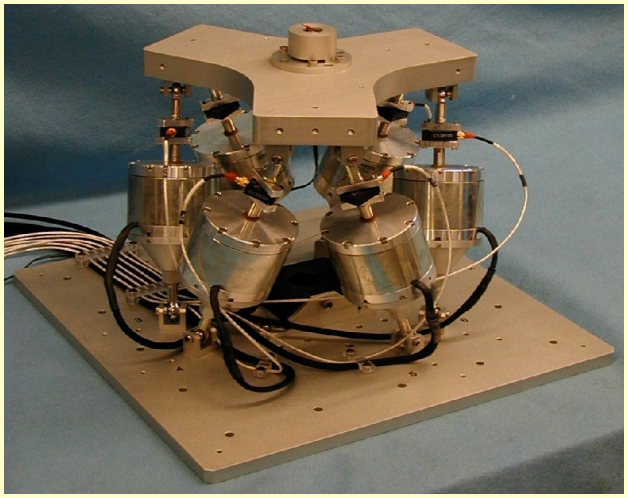
Spacecraft Research & Design Center

Department of Aeronautics and Astronautics

Naval Postgraduate School



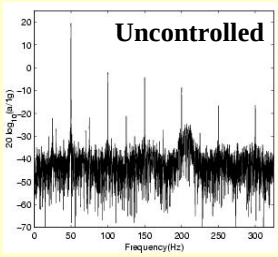
Precision Pointing Hexapod

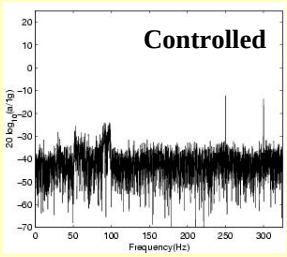


Objective: Develop and test control algorithms for vibration isolation and fine pointing of imaging payloads

- Six voice coil actuators (10mm stroke)
- Six accelerometers
- Six eddy current sensors
- One laser sensor (2D array)
- Disturbance: Aura Bass shaker
- Up to 2.5 degrees of tilt and tip
- Up to 10 degrees of twist
- The control function is performed by a dSPACE DSP system (PowerPC)

Vibration Suppression Results





A computationally efficient method for vibration suppression was developed and implemented. The method can be used to suppress any chosen frequencies, either unrelated or harmonics.

The figures show the method being applied to suppress vibration at 50, 100, 150 and 200Hz, with reduction on the fundamental frequency of as much as 70dB.

Thesis

- Christian G. Taranti, *Pointing Control and Vibration Suppression for Optical Payloads in Satellites*, Ph.D. Dissertation, Naval Postgraduate School,in progress.

Publication

- Christian G. Taranti, Brij N. Agrawal and Roberto Cristi, “An Efficient Algorithm for Vibration Suppression to Meet Pointing Requirements of Optical Payloads,” AIAA Guidance, Navigation and Control Conference, August 2001.

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